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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,180	10/15/2003	Lionell K. Griffith	7171-10910207852	7586
167	7590	02/22/2005	EXAMINER	
FULBRIGHT AND JAWORSKI L L P			KAO, CHIH CHENG G	
PATENT DOCKETING 29TH FLOOR				
865 SOUTH FIGUEROA STREET			ART UNIT	
LOS ANGELES, CA 900172576			PAPER NUMBER	
			2882	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/687,180	GRIFFITH, LIONELL K.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/4/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-14, 21-28 and 35-42 is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-20 and 29-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/7/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 1/4/05. These drawings are acceptable.

Claim Objections

2. Claims 7, 20, and 21 are objected to because of the following informalities, which appear to be minor draft errors creating grammatical or lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following suggestions may obviate their respective objections: (claim 7, line 7, "the image plane. and the source"; replacing the period with a comma), (claim 20, line 4, "the shadow"; replacing "the" with - -a- -), and (claim 21, line 11, "the shadow"; replacing "the" with - -a- -),.

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 15-17, 19, 29-31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swift (US Patent 4472822) in view of Schwarz (US Patent 6400791).

4. Regarding claims 1, 15, and 29, Swift discloses a digitized tomosynthesis method, system, and apparatus (title) for obtaining an image of an object (fig. 3, "object") in which a ray of energy from a source (fig. 5, "x-ray source") travels through the object to impinge on an energy sensor (fig. 5, "detector") defining an image plane and in which the object is rotated about an axis (fig. 5, "axis of rotation") whereby an image is acquired by the energy sensor at successive rotational positions of the object (abstract), wherein the object is rotated about an axis of rotation (fig. 5, "axis of rotation") with respect to the image plane (fig. 5, "detector").

However, Swift does not disclose obtaining a 3D volumetric image and an image plane at a canted angle to an axis.

Schwarz teaches a 3D volumetric image (col. 3, lines 54-56) and an image plane at a canted angle (fig. 3, #5) to an axis (fig. 3, axis of #7).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift with the 3D volumetric imaging and canted angle of Schwarz, since one would be motivated to make such a modification to better display objects whose center axis is inclined toward the center axis of the patient support (col. 1, lines 15-20) as shown by Schwarz.

5. Regarding claims 2, 3, 16, 17, 30, and 31, Swift further discloses x-ray radiation (title).

6. Regarding claims 5, 19, and 33, Swift further discloses the optical axis of the source (figs. 3 and 5, #11) perpendicular to the image plane (figs. 3 and 5, #18).

7. Claims 4, 18, and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Swift and Schwarz as applied to claims 1, 15, and 29 above, and further in view of Hsieh (US Patent 6226350).

Swift as modified above suggests a method, system, and apparatus as recited above.

However, Swift does not disclose a flat panel digital detector.

Hsieh teaches a flat panel digital detector (col. 2, lines 27-31).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the detector of Hsieh, since one would be motivated to make such a modification to obtain projection data faster (col. 2, lines 27-31) as implied from Hsieh.

8. Claims 6, 20, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swift and Schwarz as applied to claim 1, 15, and 29 above, and further in view of Besson et al. (US Patent 6301325) and Feldkamp et al. ("Practical cone-beam algorithm").

Swift as modified above suggests a method, system, and apparatus as recited above.

However, Swift does not specifically disclose mathematically tracing a ray of energy through a voxel, computing a coordinate of a shadow of the voxel on the image plane, and extracting and combining image data to form the object space voxel.

Besson et al. teaches computing a coordinate of a shadow of the voxel on the image plane (col. 5, lines 62-64) and extracting and combining image data to form the object space voxel

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(col. 1, lines 31-34). Feldkamp et al. teaches mathematically tracing a ray of energy through a voxel (fig. 4, line from source through “Y”).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the calculated voxel image of Besson et al., since one would be motivated to make such a modification to better determine the make up of the patient through which rays traverse (col. 1, lines 23-26) as implied from Besson et al.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the mathematical tracing of Feldkamp et al., since one would be motivated to make such a modification to perform reconstructions faster (page 612, col. 2, lines 16-18) as shown by Feldkamp et al.

Allowable Subject Matter

9. Claims 7-14, 21-28, and 35-42 contain allowable subject matter.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 7, 21, and 35, prior art does not disclose or fairly suggest a method, system, or apparatus including determining an axis of rotation of an object and comparing locations of first and second shadow images to determine source and object angles relative to an energy sensor, in combination with all the limitations in each respective claim. Claims 8-14, 22-28, and 36-42 contain allowable subject matter by virtue of their dependency.

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Response to Arguments

10. Applicant's arguments with respect to claims 1-6, 15-20, and 29-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gk



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SUPERVISORY PATENT EXAMINER